WADE-8070

Mini-ITX Board

User's Manual

Version 1.0

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Table of Contents

How to Use This Manual

Chapter 1 System Overview 1-1

1.1 Introduction 1-1
1.2 Check List 1-1
1.3 Product Specification 1-2
1.3.1 Mechanical Drawing 1-5
1.4 System Architecture 1-6

Chapter 2 Hardware Configuration 2-1

2.1 Jumper Setting 2-1
2.2 Connector Allocation 2-5

Chapter 3 System Installation 3-1

3.1 Intel® ATOM CPU 3-1
3.2 Main Memory 3-1
3.3 Installing the Single Board Computer 3-2
3.3.1 Chipset Component Driver 3-2
3.3.2 Intel Integrated Graphics GMCH Chip 3-2
3.3.3 Realtek Gigabit Ethernet Controller 3-3
3.3.4 Audio Controller 3-3
3.4 Clear CMOS Operation 3-3
3.5 WDT Function 3-4
3.6 GPIO 3-5
3.6.1 Wade-8070 GPIO Programming Guide 3-6

Chapter 4 BIOS Setup Information 4-1

4.1 Entering Setup 4-1
4.2 Main Menu 4-2
4.3 Standard CMOS Setup Menu 4-3
4.4 IDE Adaptors Setup Menu 4-4
4.5 Advanced BIOS Features 4-6
4.6 Advanced Chipset Features 4-11
4.7 Integrated Peripherals 4-14
4.8 Power Management Setup 4-19
4.9 PnP/PCI Configurations 4-23
4.10 PC Health Status 4-25
4.11 Default Menu 4-26
4.12 Supervisor/User Password Setting 4-26
4.13 Exiting Selection 4-27

Chapter 5 Troubleshooting 5-1

5.1 Hardware Quick Installation 5-1
5.2 BIOS Setting 5-2
5.3 Ordering Setting 5-4
5.4 FAQ 5-4

Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get its running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw/

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and develop a new Intel® Mini-ITX board with latest Intel® platform for embedded application. The Portwell WADE-8070 takes advantage of Intel® 45-nanometer Hi-k process technology — the first generation of low-power IA-32 microarchitecture specially designed for Embedded Platform and can support Intel® 945GSE chipset with the ICH7-M, can provide the low power consumption for fanless applications such as POS, ATM, Kiosk, Medical and Digital Signage.

WADE-8070 supports dual display by VGA, DVI and LVDS. With its display-enriched interface, WADE-8070 can support various multimedia devices and enriched IO interfaces that can supply various USB and COM devices.

WADE-8070 supports SO-DIMM memory slot for DDR2 SDRAM up to 2GB, and comes with PS/2 Keyboard and Mouse, 1 x RS232/422/485, 3 x RS232, 2 x SATA, 1 x IDE, dual Gigabit Ethernet, 6 x USB2.0 ports. It also support CompactFlash Socket and one PCIEx1 Slot for embedded application usage.

1.2 Check List

The WADE-8070 package should cover the following basic items

- ✓ One WADE-8070 Mini ITX Main Board
- ✓ One Serial ATA cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**
  - Support Intel Atom processor N270
  - CPU bus clock: 667/533 MHz
- **Chipset**
  Intel® 945GSE and ICH7-M
- **Main Memory**
  - Support signal channel DDR2 memory interface
  - Up to 2GB DDR2 533 SDRAM on SO-DIMM socket
- **System BIOS**
  AWARD BIOS
- **Expansion Interface**
  One PCI Express x1 slot
- **SATA Interface**
  Two SATA ports
- **Serial Ports**
  Support three RS-232 serial ports, one RS-232/422/485 selectable
- **IR Interface**
  N/A
- **Parallel Port**
  N/A
- **USB Interface**
  Support six USB (Universal Serial Bus) ports (four at rear, two on-board for internal devices)
- **PS/2 Mouse and Keyboard Interface**
  Support dual 6-pin mini-DIN connector at rear I/O panel for PS/2 keyboard/mouse
- **Audio Interface**
  Connector of Mic-in/Line-out
- **Real Time Clock/Calendar (RTC)**
  Support Y2K Real Time Clock/Calendar
- **Watchdog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - Generate system reset
- **On-board VGA**
  - Intel 945GSE Integrated GMA950 Graphics device
  - Intel DVMT 3.0 supports up to 128MB video memory

- **On-board Ethernet LAN**
  Dual Gigabit Ethernet (10/100/ 1000 Mbits/sec) LAN ports
- **High Driving GPIO**
  Onboard programmable 8-bit Digital I/O interface
- **Cooling Fans**
  Support two 3-pin power connector for CPU cooler and one 3-pin power connector for system fan
- **System Monitoring Feature**
  Monitor system temperature and major power sources, etc
- **Outline Dimension (L X W):**
  170mm (6.69″) X 170mm (6.69″)
- **Power Requirements:**
  +12V(CPU)@0.17A; +12V(System)@0.24A; +5V@1.31A; +3.3V@0.55A

Configuration:

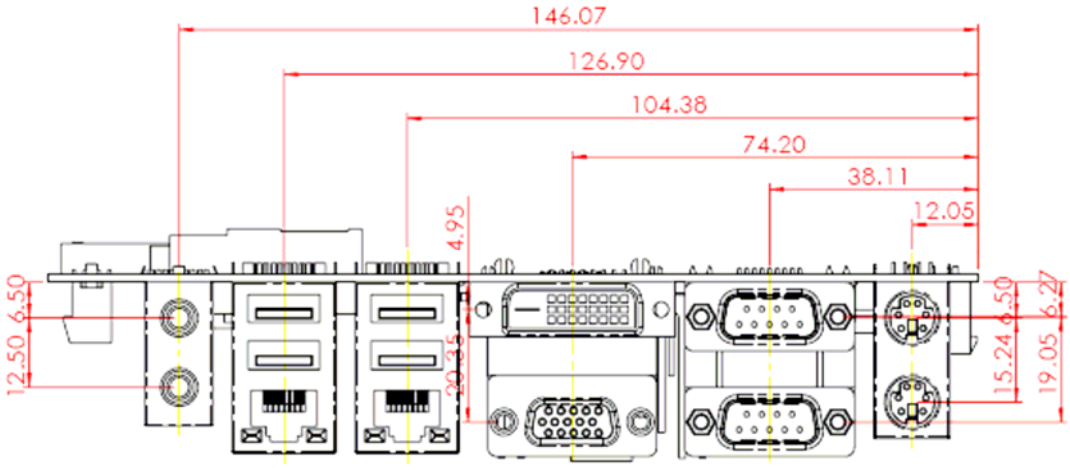
System Configuration	
CPU Type	Intel® Atom™ CPU N270 @1.60GHz FSB:533 L2:512K
SBC BIOS	Portwell,Inc.WADE-8070 BIOS Rev.:R1.00.W1.T2(01132009)
Memory	Transcend DDR2-533 512MB(ELPIDA E5109AGRG)
VGA Card	On Board Mobile Intel® 945 Express Chipset Family
VGA Driver	Mobile Intel® 945 Express Chipset Family
LAN Card	On Board Realtek RTL8111C Gigabit Ethernet
LAN Driver	Realtek RTL8168C(P)/8111C(P)PCI-EGigabit Ethernet NIC Version:5.708.1030.2008
Audio Card	On Board Realtek ALC662
Audio Driver	Realtek High Definition Audio
Chip Driver	Intel®Chipset Device Software
USB 2.0 Driver	Intel®82801G(ICH7 Family) USB2 Enhanced Host Controller Version:8.2.0.1008
IDE HDD	Seagate ST340823A(40G)
Compact Flash	Apcer AP-CF064MC2CG-NDNR(64MB)
CDROM	LITE-ON LH-20A1S
Power Supply	全漢FSP350-60GLC(350W)

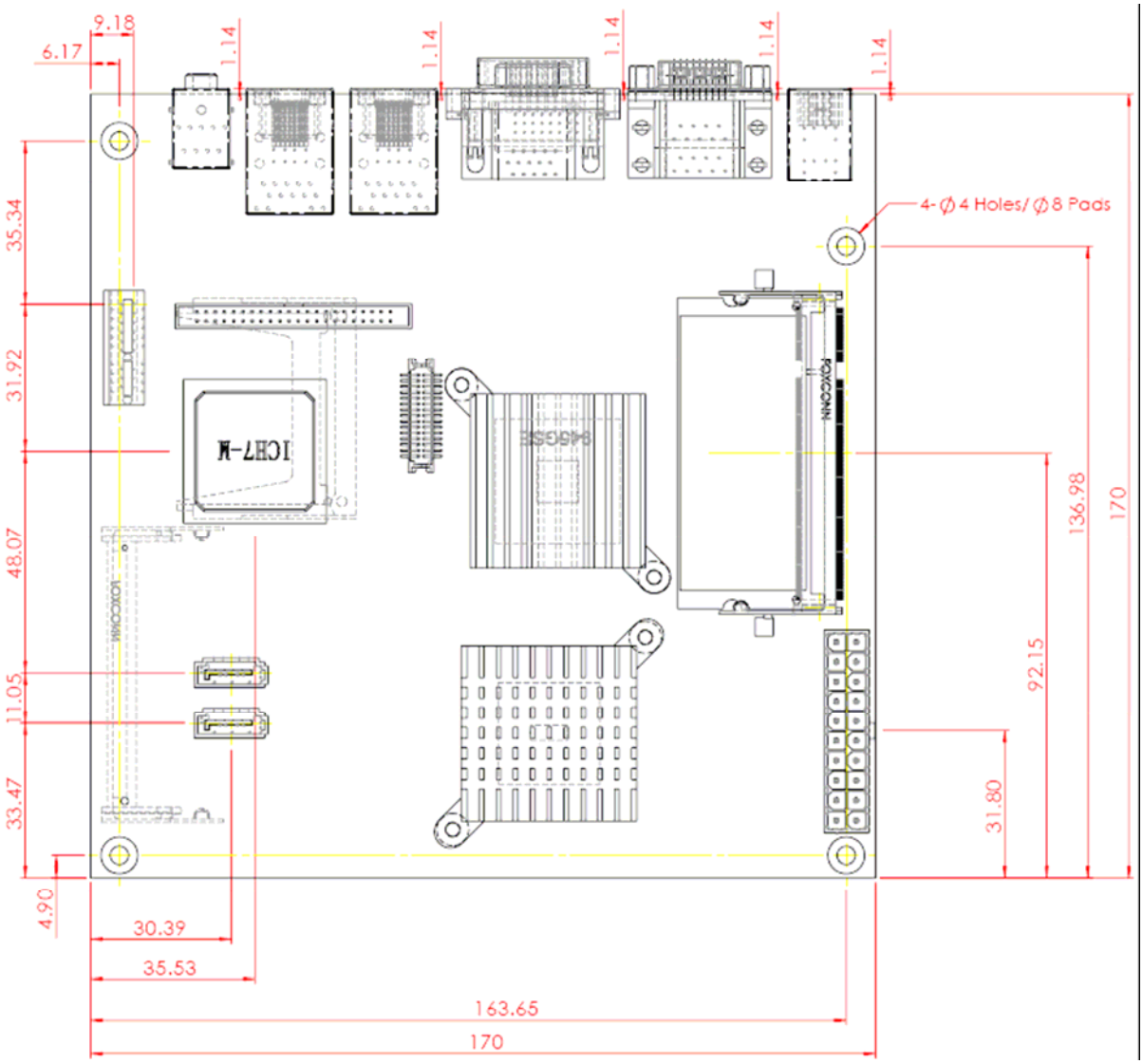
Programs for loading both CPU & VGA: Run Burning Test V5.3
RUN time: 10 / 30 Minutes.

Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	0.06A	0.06A	0.04A
System +12V	0.08A	0.13A	0.13A
System +3.3V	0.49A	0.58A	0.53A
System +5V	1.26A	2.43A	2.43A
System+ Device +12V	0.75A	0.41A	0.1A
System+ Device +5V	0.94A	1.96A	1.57A
USB Loading Test	1.7 V/ 420 mA	N/A	N/A

- **Operating Temperature:**
  0°C ~ 55°C
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  5% ~ 90%, non-condensing

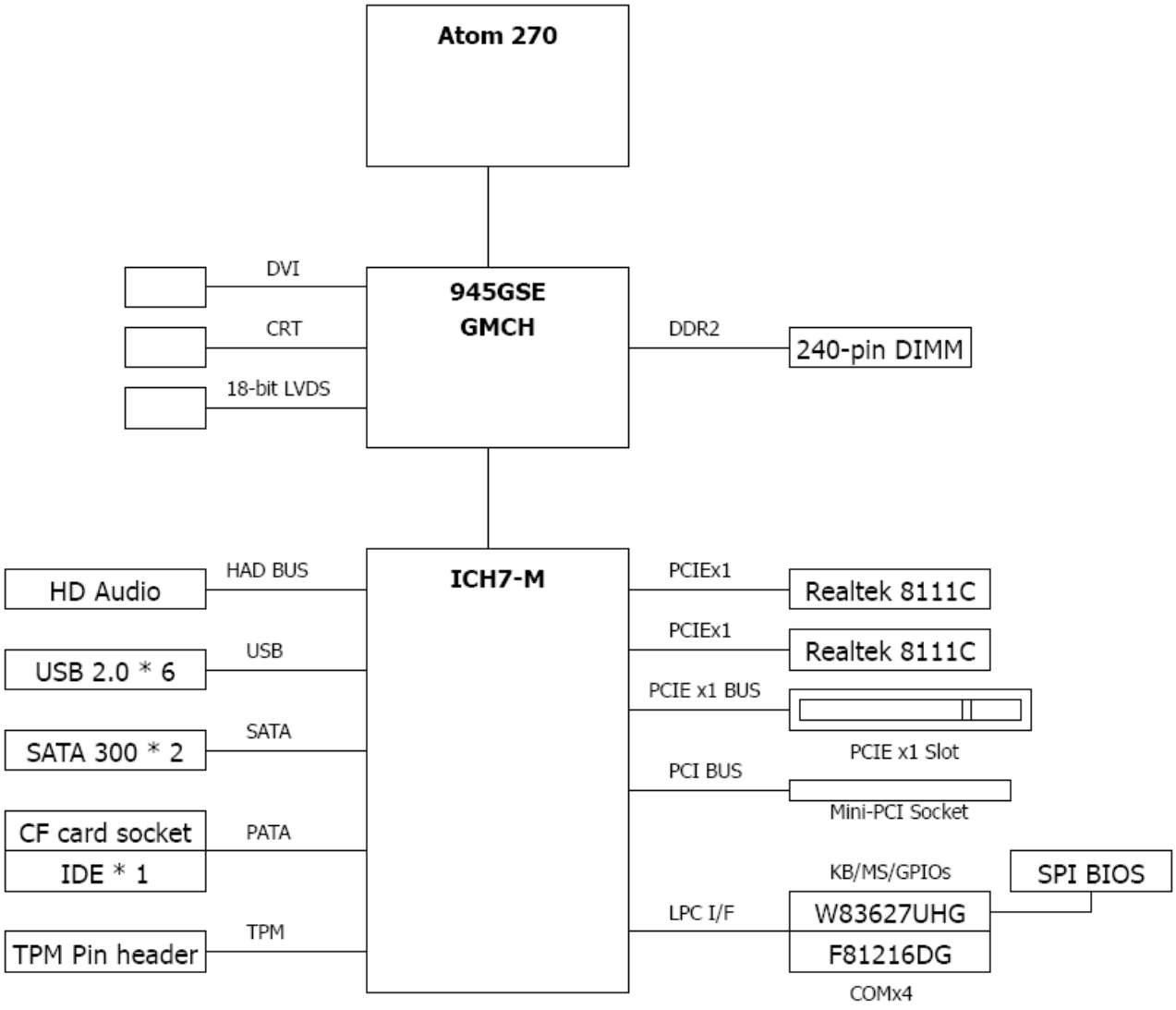
1.3.1 Mechanical Drawing





1.4 System Architecture

All of details operating relations are shown in WADE-8070 series System Block Diagram



WADE-8070 System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on WADE-8070 are in the proper position. The default settings are indicated with a star sign (★).

2.1 Jumper Setting

In order to customize WADE-8070's features for users, in the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 and Figure 2-2 for the Jumper locations.

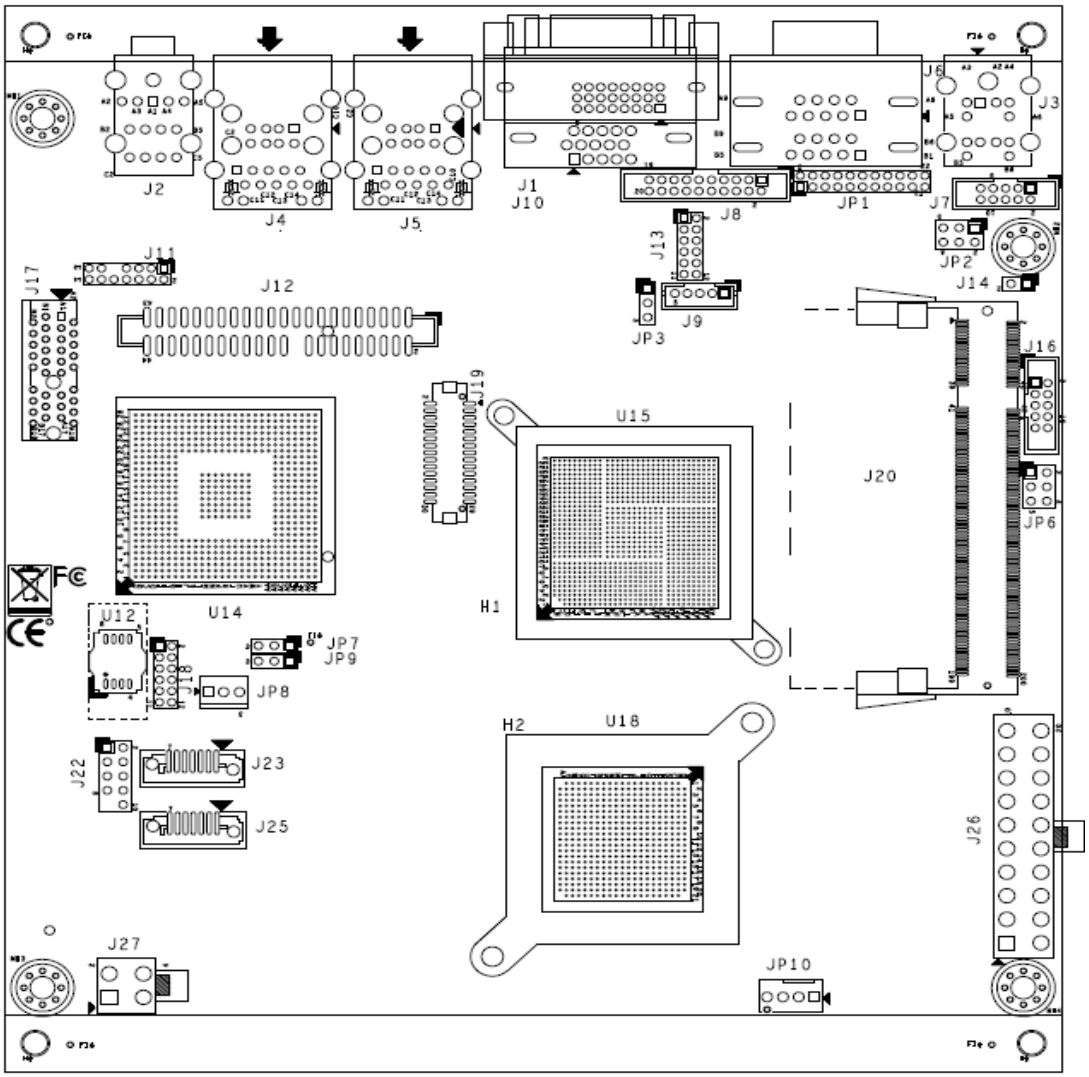


Figure 2-1 WADE-8070 Top-side Jumper and Connector Locations

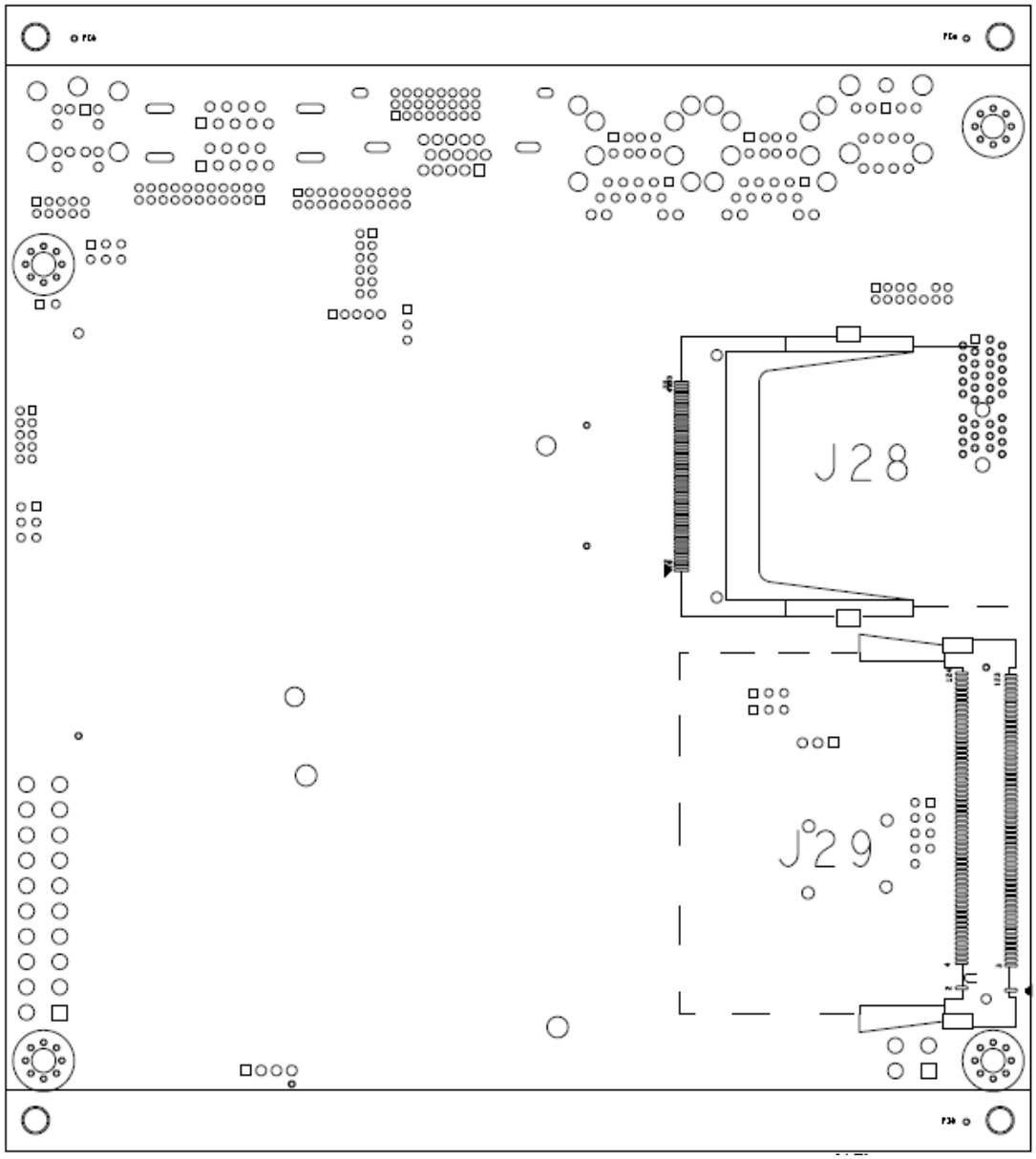
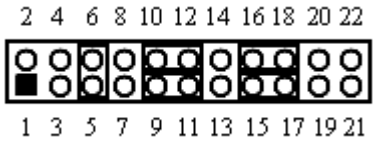
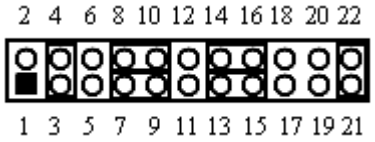


Figure 2-2 WADE-8070 Bottom-side Connector Locations

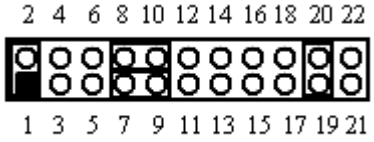
JP1 : COM2(J6 Bottom) Interface Selection



RS-232



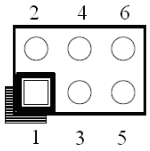
RS-422



RS-485

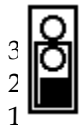
JP1	Function
5-6,9-11,10-12,15-17,16-18 Short	RS-232 ★
3-4,7-9,8-10,13-15,14-16,21-22 Short	RS-422
1-2,7-9,8-10,19-20 Short	RS-485

JP2 : Port Ring selection jumper for COM port 4

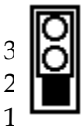


JP2	Function
3-4 Short	Normal Operation (Ring) ★
1-2 Short	12 V
5-6 Short	5 V

JP3 : LVDS Panel Backlight Voltage Selection



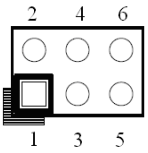
3.3V



5V

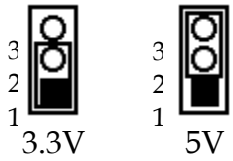
JP3	Function
1-2 Short	3.3 V ★
2-3 Short	5 V

JP6 : Port Ring selection jumper for COM port 3



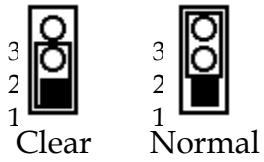
JP6	Function
3-4 Short	Normal Operation (Ring) ★
1-2 Short	12 V
5-6 Short	5 V

JP7 : LVDS Panel Drive Voltage Selection



JP7	Function
1-3 Short	3.3 V★
3-5 Short	5 V

JP9 : CMOS Normal / Clear Jumper



JP9	Function
1-2 Short	Clear CMOS Enable (Clear)
2-3 Short	Clear CMOS Disable (Normal) ★

2.2 Connector Allocation

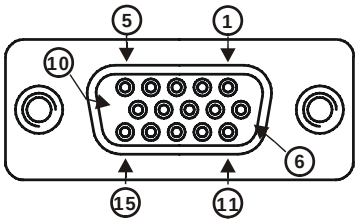
I/O peripheral devices are connected to the interface connectors

Connector Function List

Connector	Description	Remark
J1	On-board VGA CRT / DVI Connector	
J2	Audio Connector	
J3	PS/2 Keyboard/Mouse	
J4	RJ-45 0 / USB0,1	
J5	RJ-45 1 / USB2,3	
J6	COM1 / COM2 Connector	
J7	COM4 Pin Header	
J8	TPM Connector	
J9	LVDS Inverter Connector	
J11	1-3: HDD LED, 5-7: Reset, 11-13: Power Button ,2-6: SUS LED	
J12	IDE Connector	
J13	GPIO Pin Header	
J14	Case Open Connector	
J16	COM3 Pin Header	
J17	PCI-E*1 Connector	
J19	LVDS Connector	
J20	SO-DIMM Connector	
J22	USB 4/5 Connector	
J23	SATA2 Connector	
J24	Battery Connector	
J25	SATA1 Connector	
J26	ATX Power Connector	
J28	CF Connector	
J29	Mini-PCI	
JP8	System FAN (3-pin Smart FAN)	
JP10	CPU FAN (4-pin Smart FAN)	

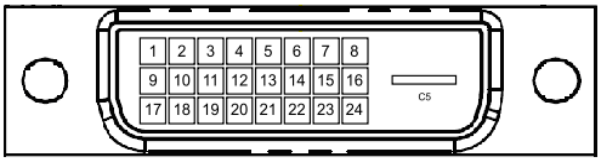
Pin Assignments of Connectors

J1 : On-board VGA CRT / DVI Connector



-**VGA Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	GREEN
3	BLUE	4	ID0
5	Ground	6	Ground
7	Ground	8	Ground
9	NC	10	Ground
11	ID1	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		



-**DVI Connector**

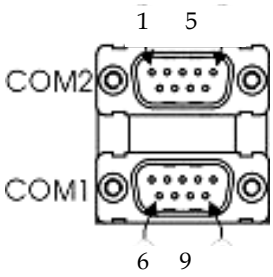
PIN No.	Signal Description
1	TMDS Data 2- Digital Red -
2	TMDS Data 2+ Digital Red +
3	TMDS Data 2/4 Shield
4	TMDS Data 4- Digital Green -
5	TMDS Data 4+ Digital Green +
6	DDC Clock
7	DDC Data
8	Analog Vertical Sync
9	TMDS Data 1- Digital Green -
10	TMDS Data 1+ Digital green +
11	TMDS Data 1/3 Shield
12	TMDS Data 3- Digital Blue -
13	TMDS Data 3+ Digital Blue +
14	+5 V Power for monitor when in standby
15	Ground Return for pin 14 and analog sync

16	Hot Plug detect
17	TMDS Data 0- Digital Blue - and Digital Sync
18	TMDS Data 0+ Digital blue + and Digital Sync
19	TMDS Data 0/5 Shield
20	TMDS Data 5- Digital Red -
21	TMDS Data 5+ Digital Red +
22	TMDS Clock Shield
23	TMDS Clock+ Digital Clock +
24	TMDS Clock- Digital Clock -
C5	Analog Ground Return for R, G and B Signals

J2 : Audio Jack

PIN No.	Signal Description
Green	Line Out1
Pink	Mic1

J6 : COM1/COM2 Serial Port Connector



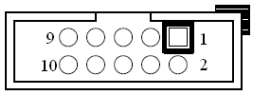
-COM2

PIN No.	Signal Description		
	RS-232	RS-422	RS-485
1	DCD (Data Carrier Detect)	TX-	DATA-
2	RXD (Receive Data)	TX+	DATA+
3	TXD (Transmit Data)	RX+	NC
4	DTR (Data Terminal Ready)	RX-	NC
5	GND (Ground)	GND	GND
6	DSR (Data Set Ready)	NC	NC
7	RTS (Request to Send)	NC	NC
8	CTS (Clear to Send)	NC	NC
9	RI (Ring Indicator)	NC	NC

-COM1

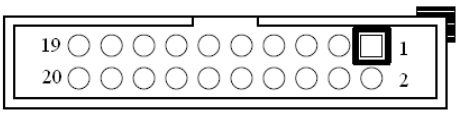
PIN No.	Signal Description
1	DCD (Data Carrier Detect)
2	RXD (Receive Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	GND (Ground)
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator) or +12V

J7 : COM Port 4 Pin Header



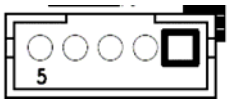
PIN No.	Signal Description
1	DCD (Data Carrier Detect)
2	DSR (Data Set Ready)
3	RXD (Receive Data)
4	RTS (Request to Send)
5	TXD (Transmit Data)
6	CTS (Clear to Send)
7	DTR (Data Terminal Ready)
8	RI (Ring Indicator) (Powered +5V/+12V with JP6 selection)
9	GND (Ground)
10 NC	

J8 : TPM 1.2 Header



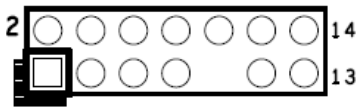
PIN No.	Signal Description	PIN No.	Signal Description
1	CLK	2	Ground
3	Frame	4	NC
5	Reset	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	Ground
13	SCL	14	SDA
15	3VSB	16	Serirq
17	Ground	18	NC
19	SUS_STAT#	20	NC

J9 : LVDS Inverter Connector



PIN No.	Signal Description
1	Backlight enable
2	Ground
3	+12V
4	Ground
5	+5V

J11 : Front Panel Connector

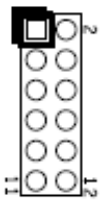


PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	5VSB
3	HD_LED	4	NC
5	SYS_Reset	6	SUS_LED
7	Ground	8	VCC
9	NC	10	NC
11	Ground	12	NC
13	Power Bottom	14	Speaker

J12 : IDE Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	NC
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground
41	+5V	42	+5V
43	Ground	44	NC

J13 : GPIO Pin Header

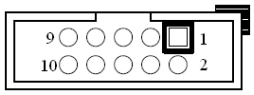


PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Ground
3	GPIO0	4	GPIO5
5	GPIO1	6	GPIO6
7	GPIO2	8	GPIO7
9	GPIO3	10	GPIO8
11	VCC	12	VCC12

J14 : Case Open Connector

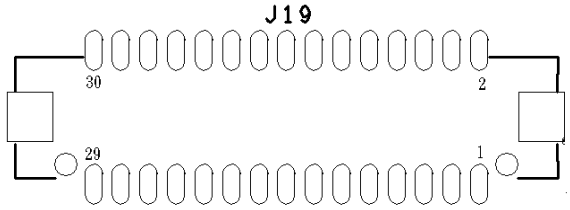
PIN No.	Signal Description
1	Case Open
2	Ground

J16 : COM Port 3 Pin Header



PIN No.	Signal Description
1	DCD (Data Carrier Detect)
2	DSR (Data Set Ready)
3	RXD (Receive Data)
4	RTS (Request to Send)
5	TXD (Transmit Data)
6	CTS (Clear to Send)
7	DTR (Data Terminal Ready)
8	RI (Ring Indicator) (Powered +5V/+12V with JP2 selection)
9	GND (Ground)
10	NC

J19 : LVDS panel signal connector

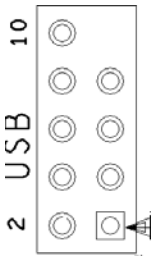


PIN No.	Signal Description	PIN No.	Signal Description
1	LVDSA_DATA0	2	LVDSA_DATA0#
3	LVDSA_DATA1	4	LVDSA_DATA1#
5	LVDSA_DATA2	6	LVDSA_DATA2#
7	NC	8	NC
9	LVDSA_CLKP	10	LVDSA_CLKN
11	LVDSB_DATA0	12	LVDSB_DATA0#
13	LVDSB_DATA1	14	LVDSB_DATA1#
15	LVDSB_DATA2	16	LVDSB_DATA2#
17	NC	18	NC
19	LVDSB_CLKP	20	LVDSB_CLKN

21	DDC_DATA	22	DDC_CLK
23	Ground	24	Back light control
25	Ground	26	Ground
27	VDD	28	VDD
29	NC	30	VDD

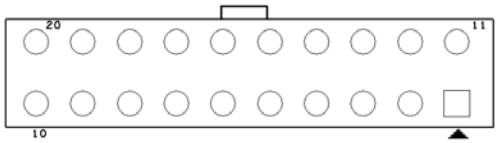
DDC: Display Data Channel. EDID support for flat panel display.

J22 : USB 4/5 connector



PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	Ground	8	Ground
		10	NC

J26 : ATX power connector



PIN No.	Signal Description	PIN No.	Signal Description
1	+3.3V	2	+3.3V
3	Ground	4	+5V
5	Ground	6	+5V
7	Ground	8	PWR_OK
9	+5V stand by	10	+12V
11	+3.3V	12	-12V
13	Ground	14	PS_ON#
15	Ground	16	Ground
17	Ground	18	-5V
19	+5V	20	+5V

J28 : CF Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	SDCS#0	8	Ground
9	Ground	10	Ground
11	Ground	12	Ground
13	+5V	14	Ground
15	Ground	16	Ground
17	Ground	18	SA2
19	SA1	20	SA0
21	Data 0	22	Data 1
23	Data 2	24	NC
25	NC	26	NC
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	SDCS#3
33	Ground	34	IOR#
35	IOW#	36	WE#
37	INT	38	+5V
39	Ground	40	NC
41	RESET#	42	IORDY
43	NC	44	REQ
45	IDEACT#	46	PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

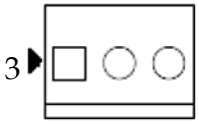
J29 : Mini-PCI

PIN No.	Signal Description	PIN No.	Signal Description
1	NC	2	NC
3	NC	4	NC
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	INTB#	18	5V
19	3.3V	20	INTA#
21	NC	22	NC

23	Ground	24	3.3VAUX
25	CLK	26	RST#
27	Ground	28	3.3V
29	REQ#	30	GNT#
31	3.3V	32	Ground
33	AD[31]	34	PME#
35	AD[29]	36	NC
37	Ground	38	AD[30]
39	AD[27]	40	3.3V
41	AD[25]	42	AD[28]
43	NC	44	AD[26]
45	C/BE[3]#	46	AD[24]
47	AD[23]	48	IDSEL
49	Ground	50	Ground
51	AD[21]	52	AD[22]
53	AD[19]	54	AD[20]
55	Ground	56	PAR
57	AD[17]	58	AD[18]
59	C/BE[2]#	60	AD[16]
61	IRDY#	62	Ground
63	3.3V	64	FRAME#
65	NC	66	TRDY#
67	SERR#	68	STOP#
69	Ground	70	3.3V
71	PERR#	72	DEVSEL#
73	C/BE[1]#	74	Ground
75	AD[14]	76	AD[15]
77	Ground	78	AD[13]
79	AD[12]	80	AD[11]
81	AD[10]	82	Ground
83	Ground	84	AD[09]
85	AD[08]	86	C/BE[0]#
87	AD[07]	88	3.3V
89	3.3V	90	AD[06]
91	AD[05]	92	AD[04]
93	NC	94	AD[02]
95	AD[03]	96	AD[00]
97	5V	98	NC
99	AD[01]	100	NC
101	Ground	102	Ground
103	AC_SYNC	104	M66EN
105	AC_SDATA_IN	106	AC_SDATA_OUT
107	AC_BIT_CLK	108	AC_CODEC_ID0#
109	AC_CODEC_ID1#	110	AC_RESET#

111	NC	112	NC
113	NC	114	Ground
115	NC	116	NC
117	NC	118	NC
119	NC	120	NC
121	NC	122	NC
123	NC	124	NC

JP8 : System Fan Connector



PIN No.	Signal Description
1	Ground
2	Fan speed control (voltage control)
3	Fan speed sense

JP10 : CPU Fan Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	Fan Speed Detecting signal
4	Fan Speed Control signal

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device, handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® ATOM CPU

WADE-8070 onboard uses Intel Atom N270 CPU 1.6GHz processor.
Introducing Intel Atom processor, a new microprocessor designed from the ground up for mobility, with a mobile-optimized chipset. Intel mobile processor innovative design techniques allow faster execution of instructions at lower power.

3.2 Main Memory

WADE-8070 provides 1 x 200-pin SO-DIMM sockets which supports 533/400 DDR2-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory size can be up to 2GB capacity. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be either one double-sided DIMM in either one DIMM socket or two single-sided SO-DIMM in both sockets.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

CPU FSB	Bandwidth
533MHz	4.2GB/s

Memory Frequency	Single Channel DDR Bandwidth
533 MHz	4.2GB/s
400 MHz	3.2GB/s

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade system performance without acquiring technical information.

Memory frequency / CPU FSB synchronization

WADE-8070 supports different memory frequencies depending on the CPU front side bus and the type of DDR2 SO-DIMM.

CPU FSB	Memory Frequency
533 MHz	533/400MHz

3.3 Installing the Single Board Computer

To install your WADE-8070 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8070 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.7 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

The chipset on WADE-8070 is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8070 CD-title.

3.3.2 Intel Integrated Graphics GMCH Chip

Using Intel® 945GSE GMCH with Media Accelerator (GMA) 950 graphics integrated chipset is aimed to gain an outstanding graphic performance. Shared 8 accompany it to 128MB system DDR2-SDRAM with Total Graphics Memory. This combination makes WADE-8070 an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI-Express by 1 VGA card can take over the system display.

Drivers Support

Please find Springdale GMCH driver in the WADE-8070 CD-title. Drivers support Windows-2000, Windows XP.

3.3.3 Realtek Gigabit Ethernet Controller

Drivers Support

Please find Realtek RTL8111C LAN driver in /Ethernet directory of WADE-8070 CD-title. The drivers support Windows 2000 /XP.

LED Indicator (for LAN status)

WADE-8070 provides two LED indicators to report Realtek RTL8111C Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

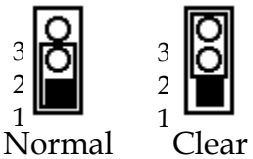
8111C	Color	Name of LED	Operation of Ethernet Port		
			Linked	Active	
Status LED	Orange	LAN Linked & Active LED	On	Blinking	
Speed LED	Orange	LAN speed LED	Giga Mbps	100 Mbps	10 Mbps
	Green		Orange	Green	Off

3.3.4 Audio Controller

Please find Realtek ALC662 Audio driver form WADE-8070 CD-title. The drivers support Windows 2000 /XP.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.



Normal Clear

JP9	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS contents

3.5 WDT Function

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);
// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);
// Assign Pin 77 WDTO Enable
outp(0x002E, 0x30);
outp(0x002F, inp(0x002F) & 0x01);
// Select Count Mode
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register & 0x08));
// Specify Time-out Value
outp(0x002E, 0xF6);
outp(0x002F, Time-out Value Register );
// Disable WDT reset by keyboard/mouse interrupts
outp(0x002E, 0xF7);
outp(0x002F, 0x00);
// Select Logic Device A
outp(0x002E, 0x07);
outp(0x002F, 0x0A);
// Active Logic Device A
outp(0x002E, 0xE7);
outp(0x002F, (inp(0x002F) & 0xF0) | ( Sel WDTO RST Register ));
// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

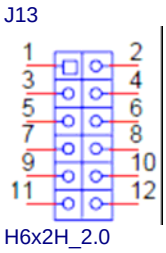
Definitions of Variables:

Value of Count-mode Register :
1) 0x00 -- Count down in seconds (Bit3=0)
2) 0x08 -- Count down in minutes (Bit3=1)
Value of Time-out Value Register :
1) 0x00 -- Time-out Disable
2) 0x01~0xFF -- Value for counting down
Value of Sel WDTO RST Register
1) 0x00 -- RST by LPC_RST (Bit3=0)
2) 0x08 -- RST by PWR_OK (Bit3=1)

3.6 GPIO

The WADE-8070 provides 4 input/output ports from SIO that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

J13 : GPIO Connector from Super I/O



PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	GND
3	GPIO Port0	4	GPIO Port5
5	GPIO Port1	6	GPIO Port6
7	GPIO Port2	8	GPIO Port7
9	GPIO Port3	10	GPIO Port8
11	5V	12	12V

3.6.1 Wade-8070 GPIO Programming Guide

Additionally, 4-extra Digital Output ports inversely amplified signals from GPIO ports. There are open-drain buffers, which can offer greater driving capacity up to 100mA.

There are two PNP I/O port addresses that can be used to configure GPIO ports,
1) 0x2E - EFER (Extended Function Enable Register, for entering Extended Function Mode)
- EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F - EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIOs.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);
// Assign Pin121-128 to be GPIO port 1
outp(0x002E, 0x29);
outp(0x002F, 0x7F);
// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);
// Active GPIO 5
outp(0x002E, 0x30);
outp(0x002F, 0x03);
// Select I/O Mode
outp(0x002E, 0xE0);
outp(0x002F, (inp(0x002F) & 0xF0) | ( I/O Selection Register & 0x0F));
// Select Inversion Mode
outp(0x002E, 0XE2);
outp(0x002F, (inp(0x002F) & 0xF0) | ( Inversion Register & 0x0F));
// Access GPIO ports
outp(0x002E, 0XE1);
outp(0x002F, (inp(0x002F) & 0xF0) | ( Output Data & 0x0F));
or Input Data = inp(0x002F);
// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:
Each bit in the lower nibble of each Register represents the setting of a GPIO port.
Bit0 vs. GPIO port 0
Bit1 vs. GPIO port 1
Bit2 vs. GPIO port 2
Bit3 vs. GPIO port 3
Bit4 vs. GPIO port 5
Bit5 vs. GPIO port 6
Bit6 vs. GPIO port 7
Bit7 vs. GPIO port 8

Value of **Inversion Register :**
Only lower nibble is available for this function.
When set to a '1', the incoming/outgoing port value is inverted.
When set to a '0', the incoming/outgoing port value is the same as in Data Register.
Value of **I/O Selection Register :**
Only lower nibble is available for this function.
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.
Value of **Output Data / Input Data :**
Only lower nibble is available for this function.
If a port is assigned to be an output port, then its respective bit can be read/written.
If a port is assigned to be an input port, then its respective bit can be read only.

Notes:
1) All the Buffered Digital Outputs are open-drain amplified form corresponding GPIO ports.
2) Some other functions may occupy the high nibble of the registers. Altering any content in high nibble will be undesire

Chapter 4
BIOS Setup Information

WADE-8070 is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8070 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

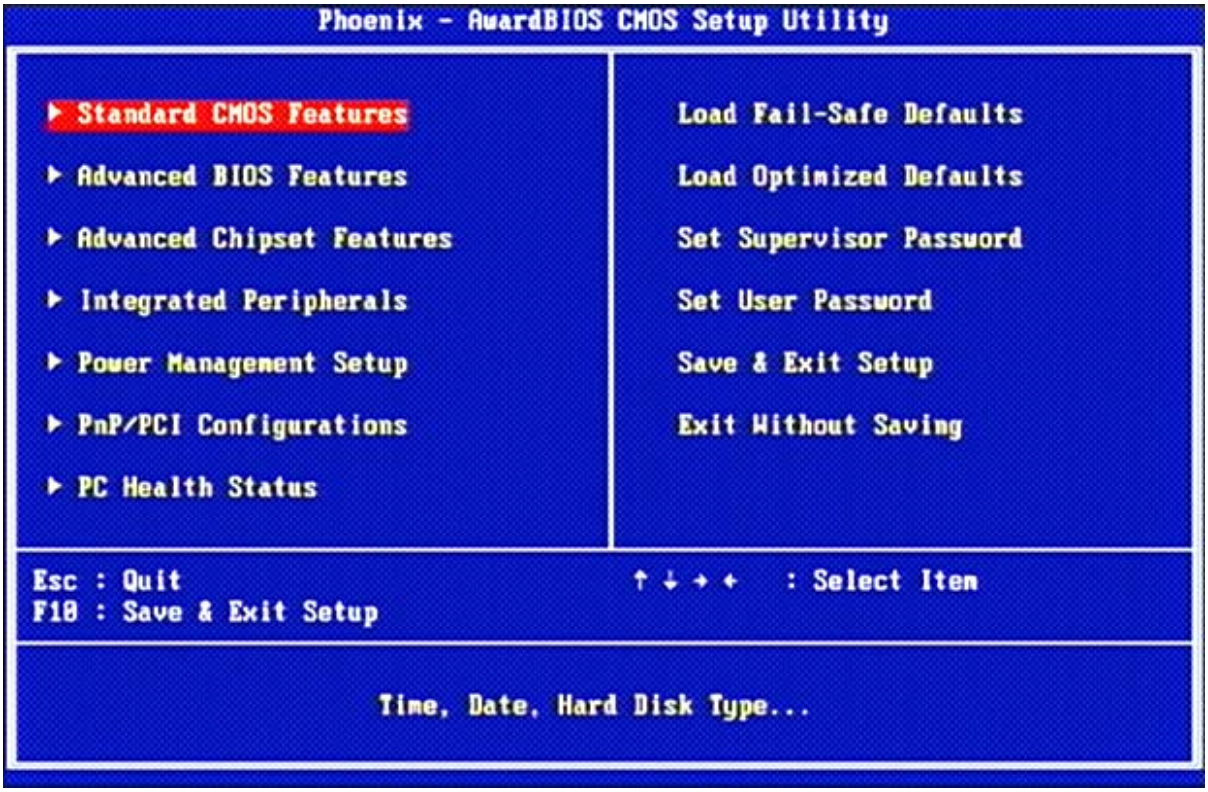
Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.2 Main Menu

Once you enter WADE-8070 AWARD BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

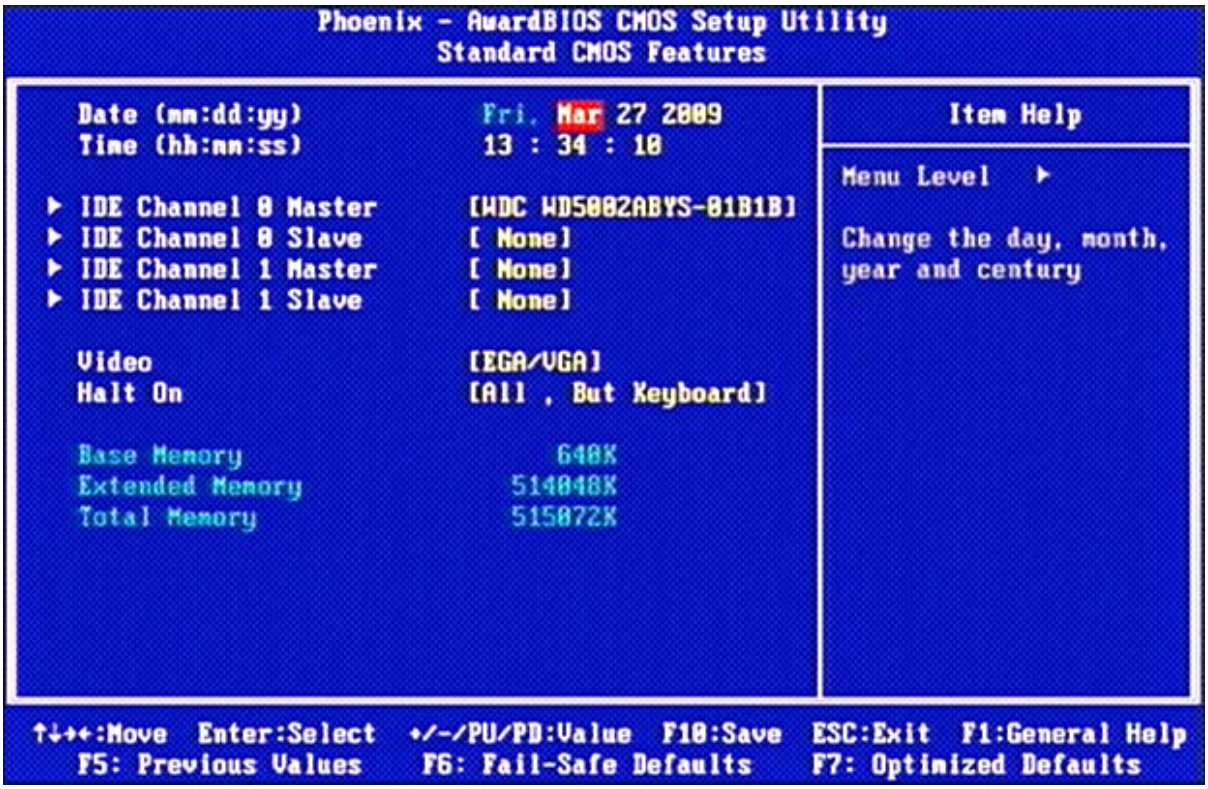


Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

4.3 Standard CMOS Setup Menu

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, **Drive type**, and **Boot Sector Virus Protection Status**.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Fri, Mar 27 2009
Time (hh:mm:ss) 13 : 34 : 10
IDE Channel 0 Master [WDC WD5002ABYS-01B1B]
IDE Channel 0 Slave [None]
IDE Channel 1 Master [None]
IDE Channel 1 Slave [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 640K
Extended Memory 514048K
Total Memory 515072K
Item Help
Menu Level ▸
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
Oblique items are base on memory capacity which user adopts on single board.

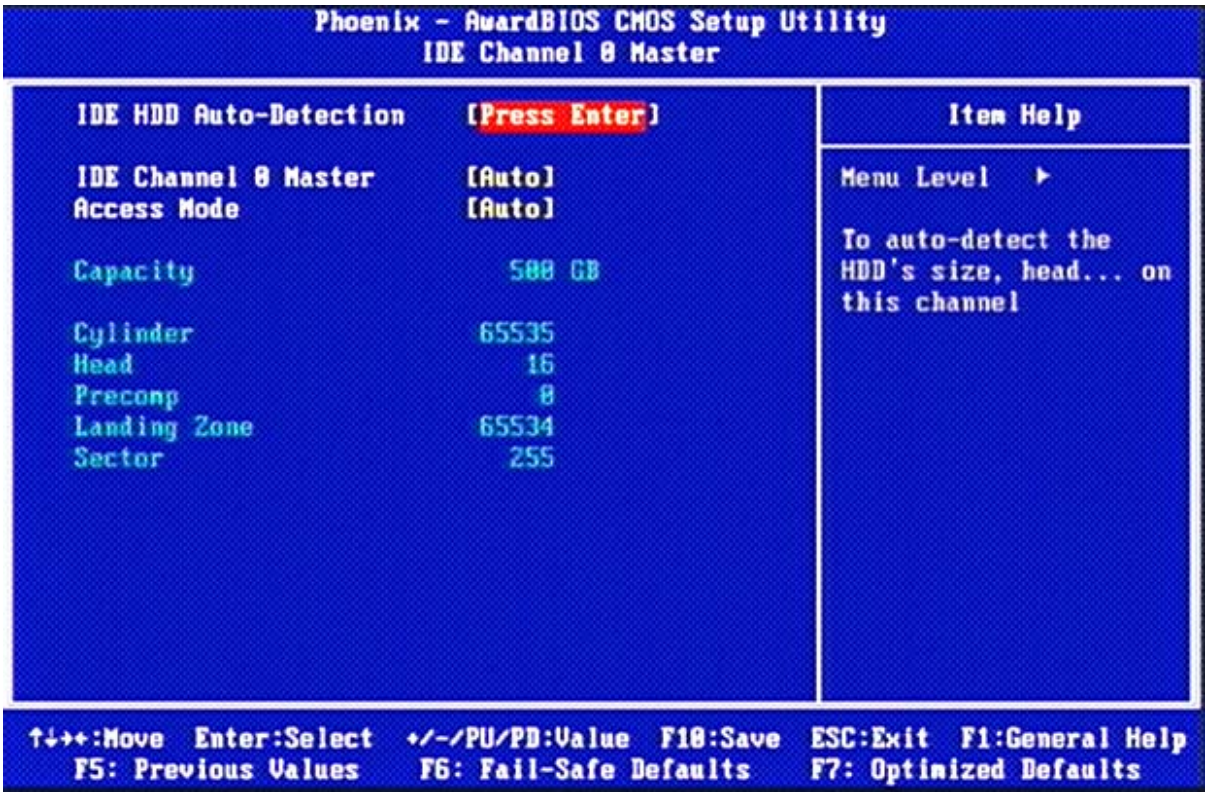
■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter next page for detail hard druve settings
IDE Channel 0 Slave		
IDE Channel 1 Master		

IDE Channel 1 Slave		
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	639K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive.


Phoenix - AwardBIOS CMOS Setup Utility
IDE Channel 0 Master
IDE HDD Auto-Detection [Press Enter]
IDE Channel 0 Master [Auto]
Access Mode [Auto]
Capacity 500 GB
Cylinder 65535
Head 16
Precomp 0
Landing Zone 65534
Sector 255
Item Help
Menu Level ▸
To auto-detect the HDD's size, head... on this channel
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

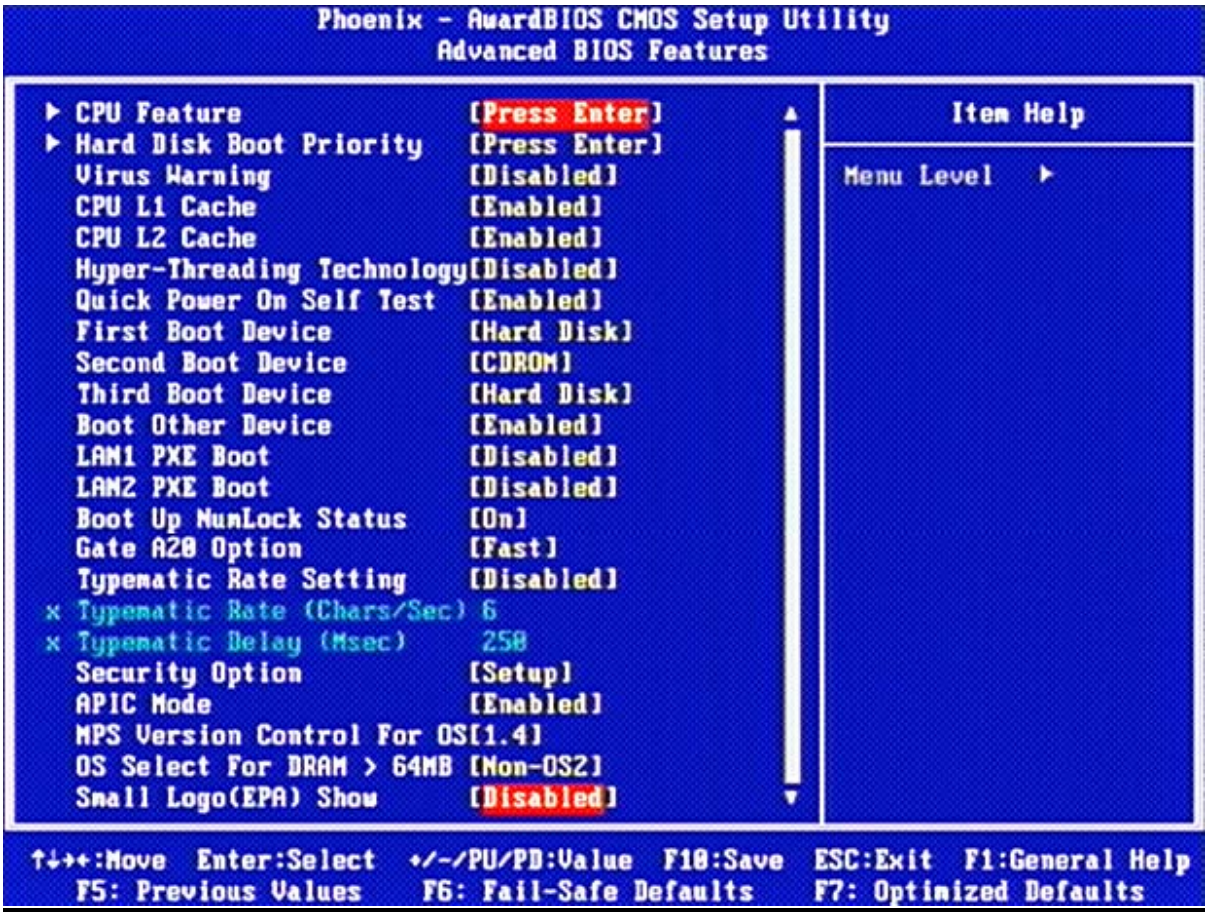
Note:
The oblique items are meaning base on what kind of storage device user employs.

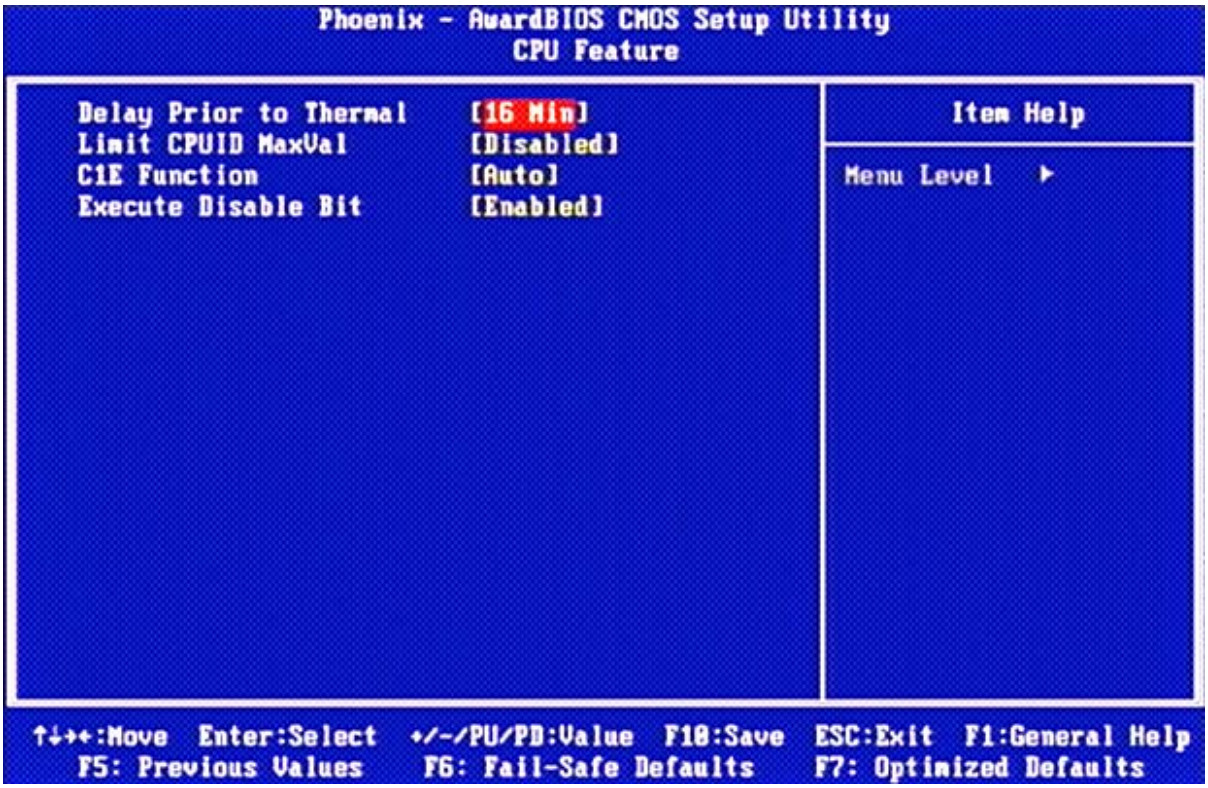
■ **Menu Selections**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min=0, Max=65535	Set the number of cylinders for hard disk
Head	Min=0, Max=255	Set the number of read/write heads
Precomp	Min=0, Max=65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min=0, Max=65535	****
Sector	Min=0, Max=255	Number of sectors per track

4.5 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
CPU Feature [Press Enter]
Hard Disk Boot Priority [Press Enter]
Virus Warning [Disabled]
CPU L1 Cache [Enabled]
CPU L2 Cache [Enabled]
Hyper-Threading Technology [Disabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [CDROM]
Third Boot Device [Hard Disk]
Boot Other Device [Enabled]
LAN1 PXE Boot [Disabled]
LAN2 PXE Boot [Disabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option [Setup]
APIC Mode [Enabled]
MPS Version Control For OS [1.4]
OS Select For DRAM > 64MB [Non-OS2]
Small Logo(EPA) Show [Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults


Phoenix - AwardBIOS CMOS Setup Utility
CPU Feature
Delay Prior to Thermal [16 Min]
Limit CPUID MaxVal [Disabled]
C1E Function [Auto]
Execute Disable Bit [Enabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

C1E Function

CPU C1E Function Select.

The choice: Auto, Disabled.

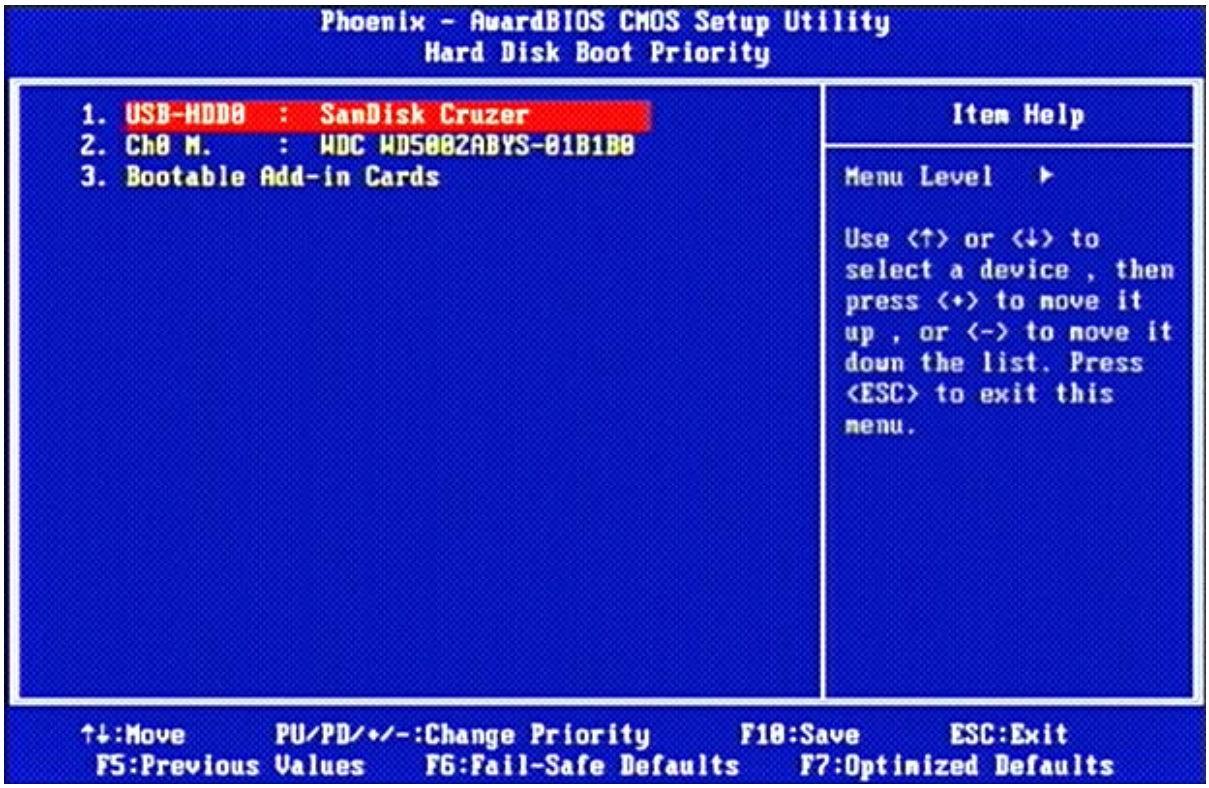
Execute Disabled Bit

When disabled, forces the XD feature flag to always return 0.

The choice: Enabled, Disabled.

Core Multi-Processing

The choice: Enabled, Disabled.


Phoenix - AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority
1. USB-HDD0 : SanDisk Cruzer
2. Ch0 M. : WDC WD5002ABYS-01B1B0
3. Bootable Add-in Cards
Item Help
Menu Level ▶
Use (↑) or (↓) to select a device , then press (+) to move it up , or (-) to move it doun the list. Press (ESC) to exit this menu.
↑↓:Move PU/PD/+/-:Change Priority F10:Save ESC:Exit
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Hard Disk Boot Priority

Select Hard Disk Boot Device Priority. Use < ↑ > or < ↓ > to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.

Virus Warning

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 Cache/L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable Cache
Disabled	Disable Cache

Hyper-Threading Technology

"Enabled" for Windows XP and Linux 2.4.X (OS optimized for Hyper-Threading Technology and "Disabled" for other OS (OS not optimized for Hyper-Threading Technology).

The choice: Enabled, Disabled.

Quick Power On Self Test

Allows the system to skip certain tests while boot up. This will shorter the time to boot the system.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third Boot Device

Select your Boot Device Priority.

The choice: LS120, Hard Disk, CDROM, ZIP 100, USB-FDD, USB-ZIP, USB-CDROM and Disabled.

Boot Other Device

Select your Boot Device Priority.

The choice: Enabled, Disabled.

LAN1/LAN2 PXE Boot

Select your boot from PXE.

The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control GateA20 and Normal – a pin in the keyboard controller controls GateA20. Default is fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keyboard repeat at a rate determined by the keyboard controller – when enabled, the typematic rate and typematic delay can de select.

The choice: Disabled, Enabled.

※Typematic Rate (Chars/sec)

The rate is which character repeats when you hold down a key.

The choice: 6, 8, 10, 12, 15, 20, 24, and 30. (Default 6)

※Typematic delay (Msec)

The delay before keystrokes begin to repeat.

The choice: 250, 500, 750, and 1000. (Default 250)

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

APIC Mode

The choice: Enabled, Disabled.

MPS Version Control For OS

The choice: 1.1, 1.4

OS Select For DRAM > 64MB

Select OS/2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

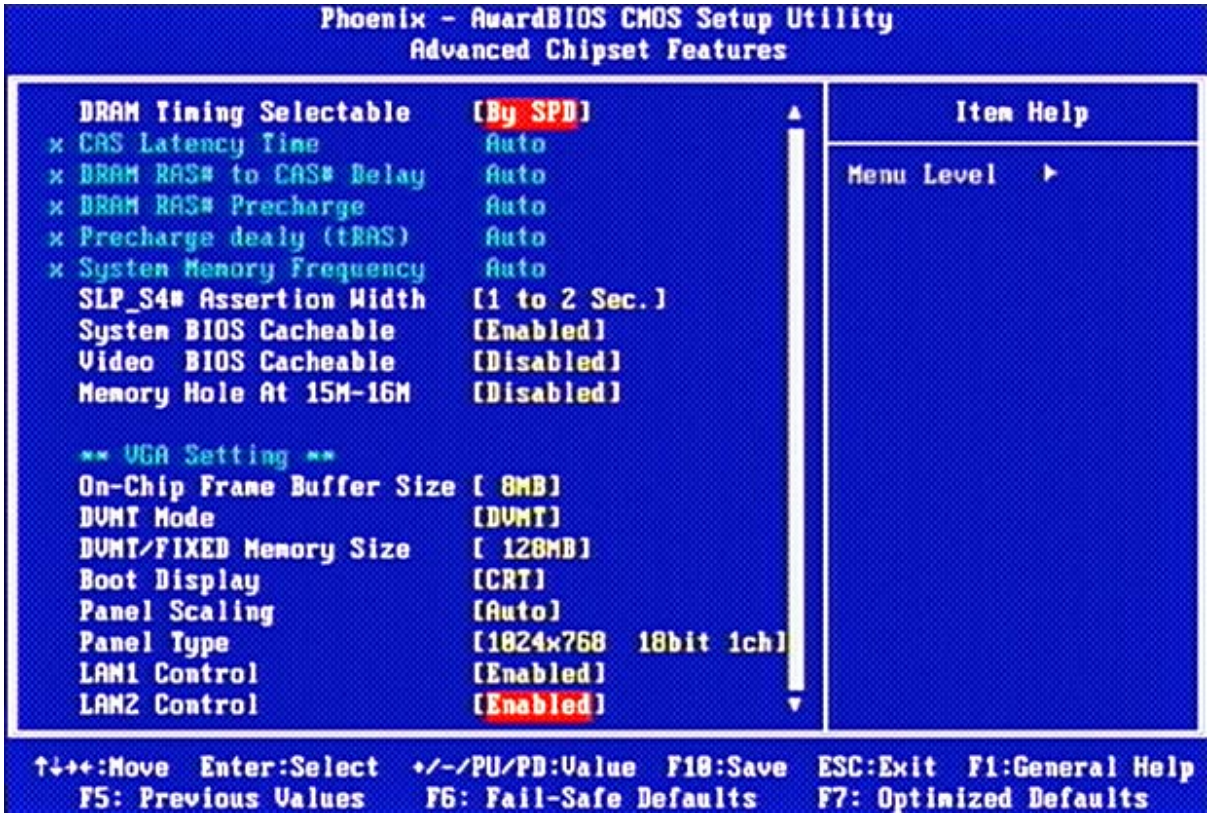
The choice: Non-OS2, OS2.

Small Logo (EPA) Show

The choice: Enabled, Disabled.

4.6 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the Intel GME965 chipset. This chipset manages bus speeds and access to system memory resources, such as DDR2 SO-DIMM and the external cache. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system. The only time user might consider making any changes would be if you discovered that data was being lost while during system operation.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
DRAM Timing Selectable [By SPD]
x CAS Latency Time Auto
x DRAM RAS# to CAS# Delay Auto
x DRAM RAS# Precharge Auto
x Precharge dealy (tRAS) Auto
x System Memory Frequency Auto
SLP_S4# Assertion Width [1 to 2 Sec.]
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Disabled]
Memory Hole At 15M-16M [Disabled]
** VGA Setting **
On-Chip Frame Buffer Size [8MB]
DVMT Mode [DVMT]
DVMT/FIXED Memory Size [128MB]
Boot Display [CRT]
Panel Scaling [Auto]
Panel Type [1024x768 18bit 1ch]
LAN1 Control [Enabled]
LAN2 Control [Enabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DRAM Timing Selectable

This option provides DIMM plug-and-play support by serial presence detect (SPD) mechanism via the system management bus (SMBUS) interface.

The choice: Manual, By SPD.

CAS Latency Time

This option controls the number of SCLKs between the time a read command is sampled by the DRAMs and the time the GMCH samples correspondent data from the DRAMs.

The choice: 3, 4, 5, 6, and Auto.

DRAM RAS# to CAS# Delay

This option controls the number of SCLKs (SDRAM Clock) from a row activate command to a read or write command. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. Normally, the option will be set to Auto.

The choice: 2, 3, 4, 5, 6, and Auto.

DRAM RAS# Precharge

This option controls the number of SCLKs for RAS# precharge. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. It is set to auto normally.

The choice: 2, 3, 4, 5, 6, and Auto.

Precharge delay (tRAS)

The choice: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15, Auto.

System Memory Frequency

Users are recommended to use Auto for memory frequency selection.

The choice: 400MHz, 533MHz, 667MHz, and Auto.

SLP_S4# Assertion Width

The choice: 4 to 5 Sec., 3to 4 Sec, 2 to 3 Sec., 1 to 2 Sec.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The choice: Enabled, Disabled.

Video BIOS Cacheable

Select "Enabled" to enable caching VGA BIOS into L2 cache to get higher display performance. "Disabled" to ignore this BIOS caching function.

The choice: Enabled, Disabled.

Memory Hole At 15-16M

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The choice: Enabled, Disabled.

On-Chip Frame Buffer Size

Users can set the display memory size that shared from main memory.

The choice: 1MB, 8MB.

DVMT Mode

The choice: FIXED, DVMT, BOTH

DVMT/FIXED Memory Size

The choice: 64MB, 128MB, 224MB.

Boot Display

The choice: CRT, LVDS, CRT+LVDS, DVI, CRT+DVI.

Panel Scaling

The choice: Auto, On, Off.

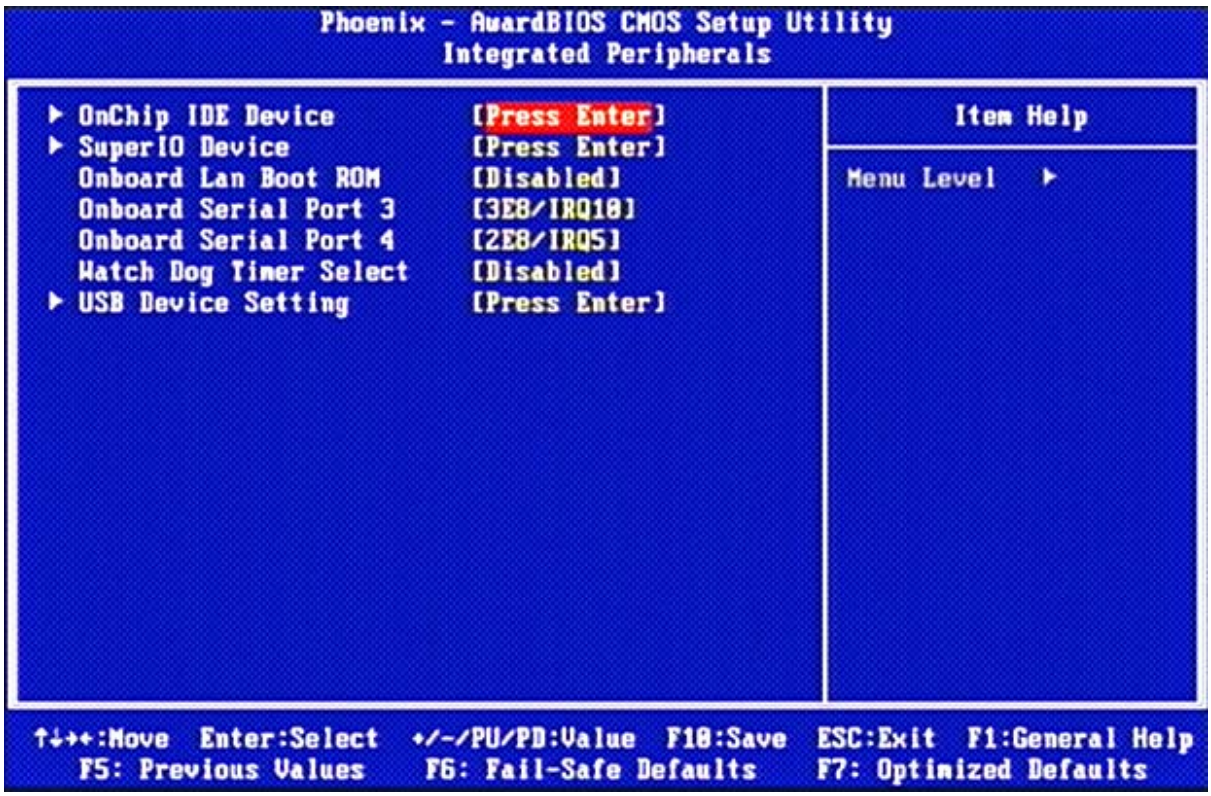
Panel Number

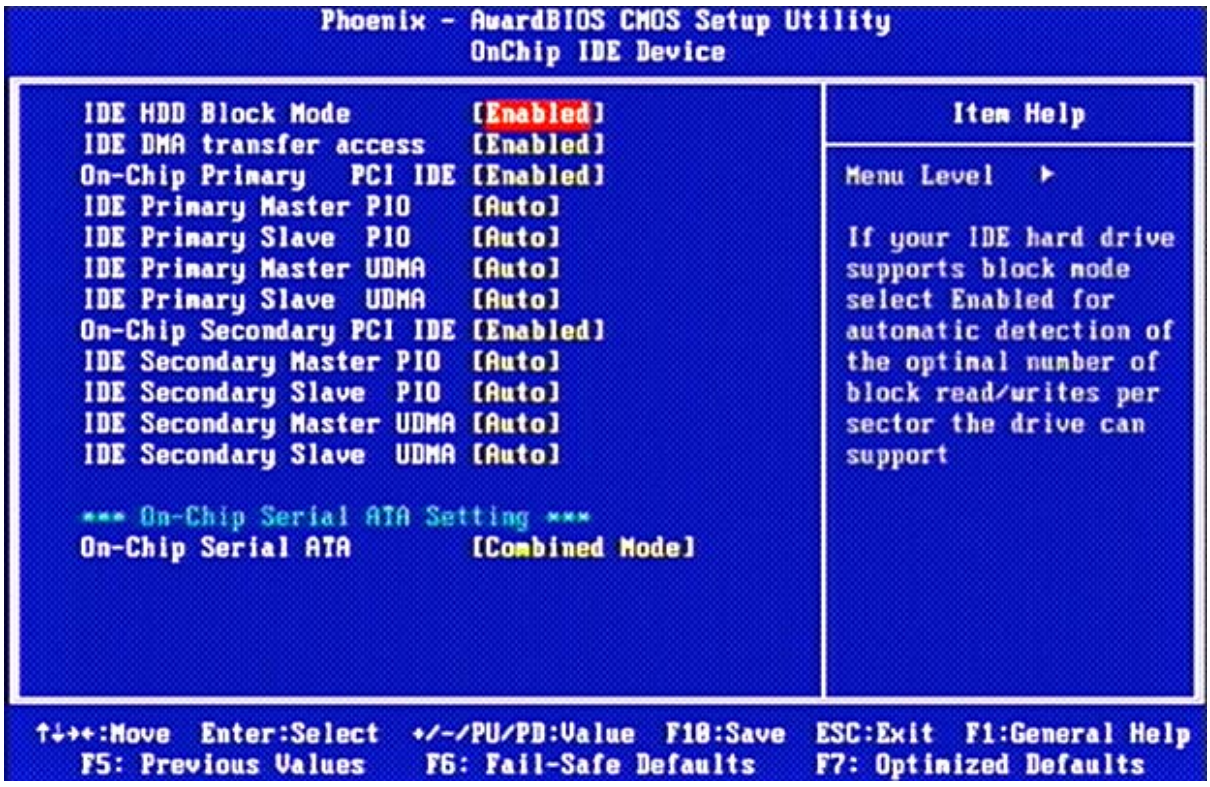
The choice: 640x480 18bits, 800x600 18bits, 1024x768 18bits, 1280x1024 24bits.

LAN1/LAN2 Control

The choice: Enabled, Disabled.

4.7 Integrated Peripherals


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
SuperIO Device [Press Enter]
Onboard Lan Boot ROM [Disabled]
Onboard Serial Port 3 [3E8/IRQ10]
Onboard Serial Port 4 [2E8/IRQ5]
Watch Dog Timer Select [Disabled]
USB Device Setting [Press Enter]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults


Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
IDE DMA transfer access [Enabled]
On-Chip Primary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
On-Chip Secondary PCI IDE [Enabled]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
*** On-Chip Serial ATA Setting ***
On-Chip Serial ATA [Combined Mode]
Item Help
Menu Level ▶
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

IDE HDD Block Mode

If IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled.

IDE DMA transfer access

The choice: Enabled, Disabled.

On-Chip Primary/ Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

The choice: Enabled, Disabled

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields allow set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if IDE hard drive supports and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

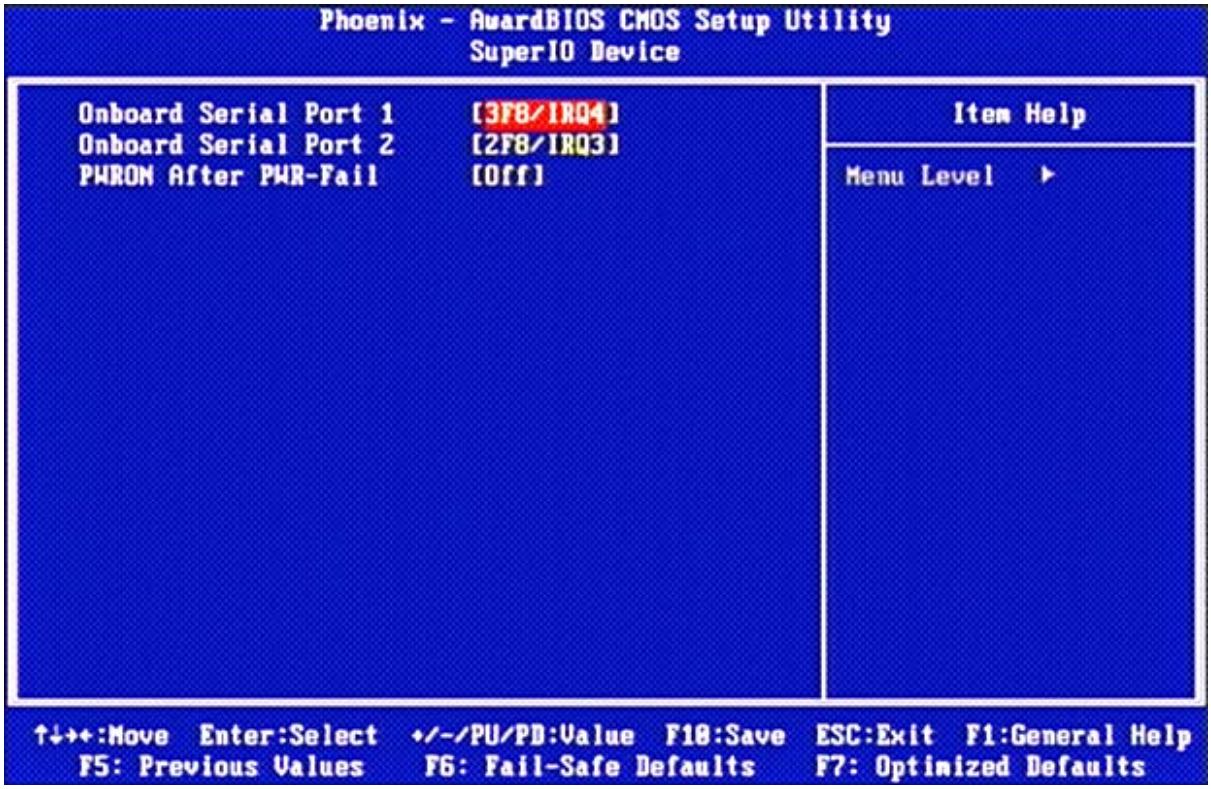
The choice: Auto, Disabled.

On-Chip Serial ATA

[Disabled]: Disabled SATA Controller. [Combined Mode]: PATA and SATA are combined. Max. of 2 IDE drives in each channel. [Enhanced Mode]: Enable both SATA and PATA. Max. of 4 IDE drives are supported. [SATA only]: Only enable SATA.

The Choice: Disabled, Auto, Combined Mode, Enhanced Mode, SATA Only.

SuperIO Device


Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
PWRON After PWR-Fail [Off]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

The choice: Off, On, Former-Sts

Onboard Lan Boot ROM

Users can enable or disable onboard LAN boot rom Function.

The choice: Enabled, Disabled.

Onboard Serial Port 3/Port 4

Select an address and corresponding interrupt for the first and second serial ports.

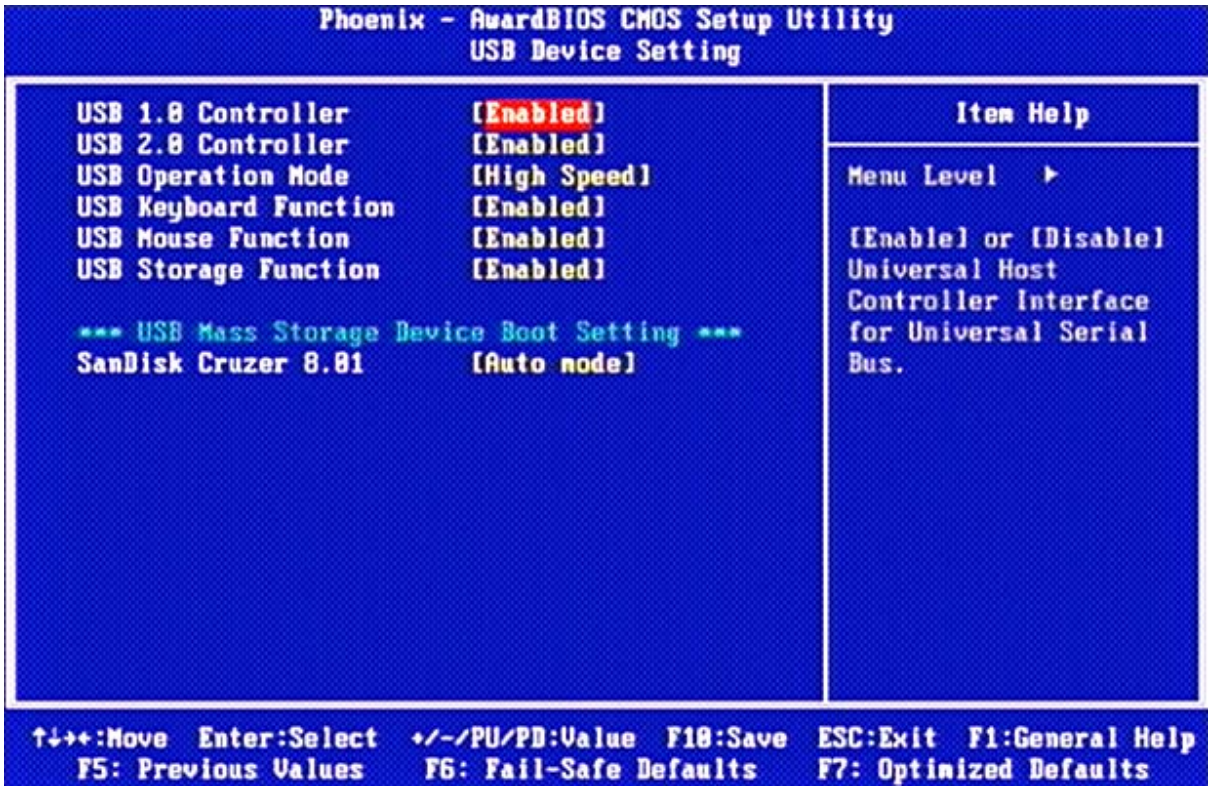
The choice: Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

Watch Dog Timer Select

This BIOS testing option is able to reset the system according to the selected table.

The choice: Disabled, 10 Sec, 20 Sec, 30 Sec, 40 Sec, 1 Min, 2 Min, and 4 Min.

USB Device Setting


Phoenix - AwardBIOS CMOS Setup Utility
USB Device Setting
USB 1.0 Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Operation Mode [High Speed]
USB Keyboard Function [Enabled]
USB Mouse Function [Enabled]
USB Storage Function [Enabled]
*** USB Mass Storage Device Boot Setting ***
SanDisk Cruzer 8.01 [Auto mode]
Item Help
Menu Level ▶
[Enable] or [Disable] Universal Host Controller Interface for Universal Serial Bus.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

USB 1.0 Controller

[Enabled] or [Disabled] Universal host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB 2.0 Controller

[Enabled] or [Disabled] Enhanced host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB Operation Mode

Auto decides USB device operation mode. [High speed]: If USB device was high speed device, then it operated on high speed mode. If USB device was full/low speed device, then it operated on full/low speed mode; [Full/Low speed]: All of USB device operated on Full/Low speed mode.

The choice: High Speed, Full/Low Speed.

USB Keyboard/Mouse Function

[Enabled] or [Disabled] Legacy support of USB keyboard or mouse.

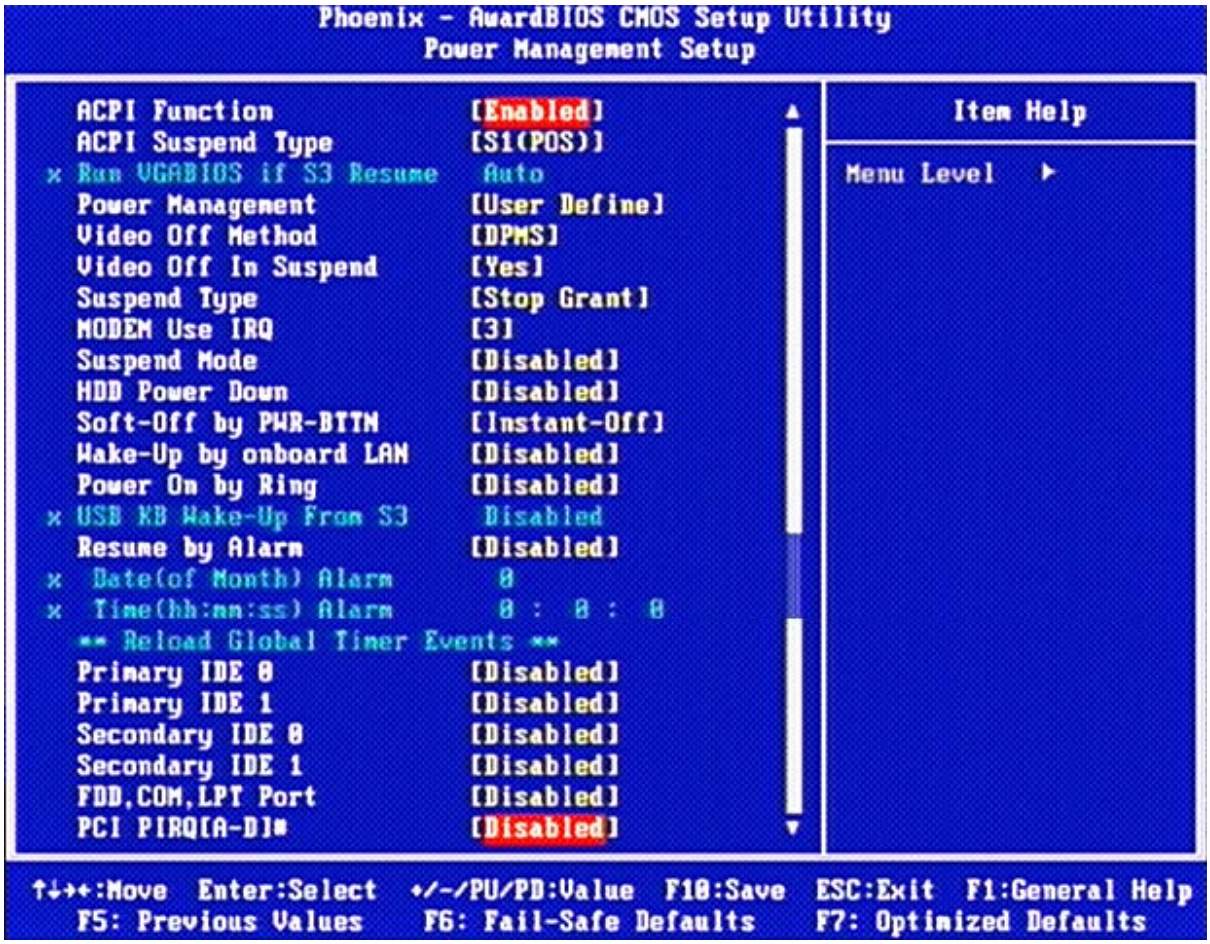
The choice: Disabled, Enabled.

USB Storage Function

[Enabled] or [Disabled] Legacy support of USB Mass Storage.

4.8 Power Management Setup

The Power Management Setup allows configuration of the system to most effectively save energy while operating in a manner consistent with your own style of computer use.


Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
ACPI Function [Enabled]
ACPI Suspend Type [S1(POS)]
x Run VGABIOS if S3 Resume Auto
Power Management [User Define]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
Suspend Type [Stop Grant]
MODEM Use IRQ [3]
Suspend Mode [Disabled]
HDD Power Down [Disabled]
Soft-Off by PWR-BTTN [Instant-Off]
Wake-Up by onboard LAN [Disabled]
Power On by Ring [Disabled]
x USB KB Wake-Up From S3 Disabled
Resume by Alarm [Disabled]
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary IDE 0 [Disabled]
Primary IDE 1 [Disabled]
Secondary IDE 0 [Disabled]
Secondary IDE 1 [Disabled]
FDD,COM,LPT Port [Disabled]
PCI PIRQ[A-D]# [Disabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S1 (POS), S3 (STR).

Run VGA BIOS if S3 Resume

The choice: Auto, Yes, No.

Power Management

This category allows selecting the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

Two options are available: Stop Grant and PwrOn Suspend.

The choice: Stop Grant, PwrOn Suspend.

MODEM Use IRQ

The choice: NA, 3,4,5,7,9,10,11.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, and 1 Hour.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

Power On by Ring

When select "Enabled", a system that is at soft-off mode will be alert to Wake-On-Modem signal.

The choice: Enabled, Disabled.

Wake Up By Onboard LAN

The choice: Disabled, Enabled.

※USB KB Wake-Up From S3

The choice: Enabled, Disabled.

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

※Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

※Time (hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

FDD, COM, LPT Port

This item is to configure floppy device, COM ports, and parallel port being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

PCI PIRQ[A-D]#

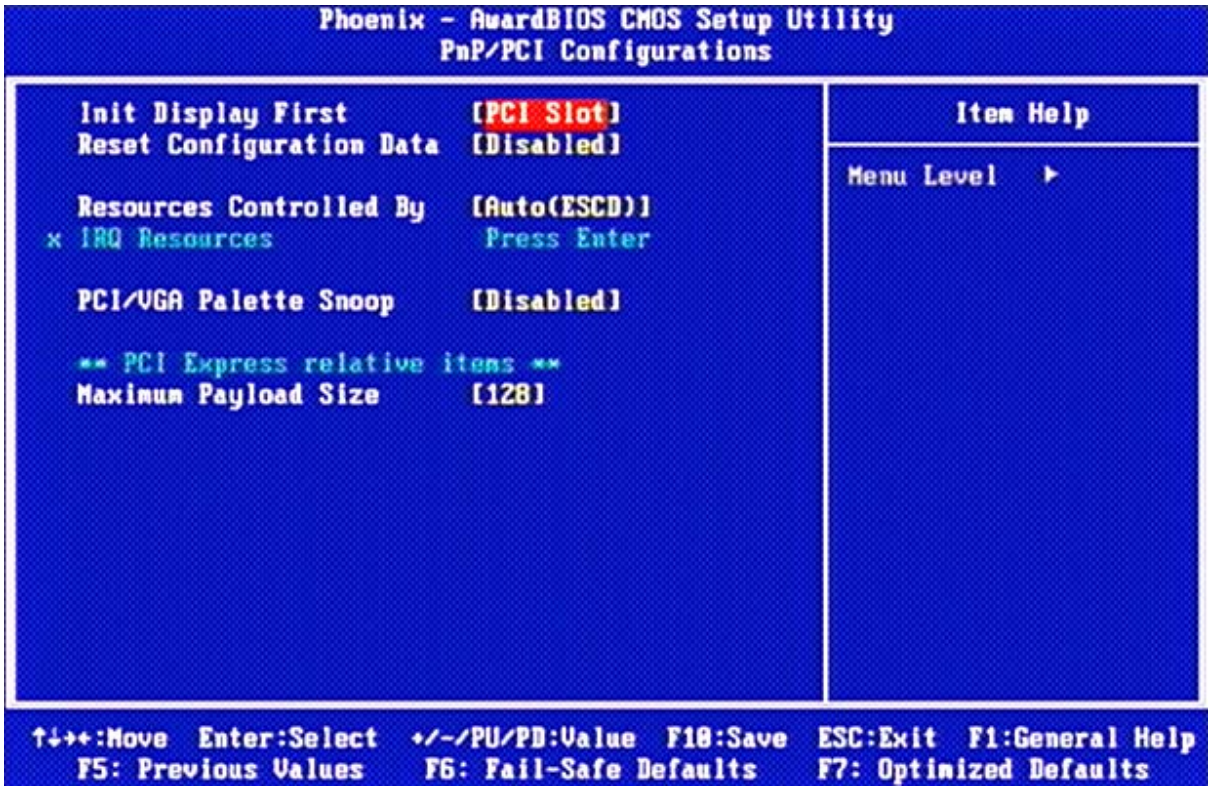
This option can be used to detect PCI device activities. If they are activities, the system will go into sleep mode.

The choice: Enabled, Disabled.

4.9 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Init Display First [PCI Slot]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Init Display First

The choice: PCI Slot, Onboard, PCIEx.

Reset Configuration Data

Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

Resource Controlled By

BIOS can automatically configure the entire boot and plug and play compatible devices. If set to Auto, IRQ DMA and memory base address fields can not be selected, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

※IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

The choice: Press Enter.

IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

The choice: PCI Device, Reserved.

PCI/VGA Palette Snoop

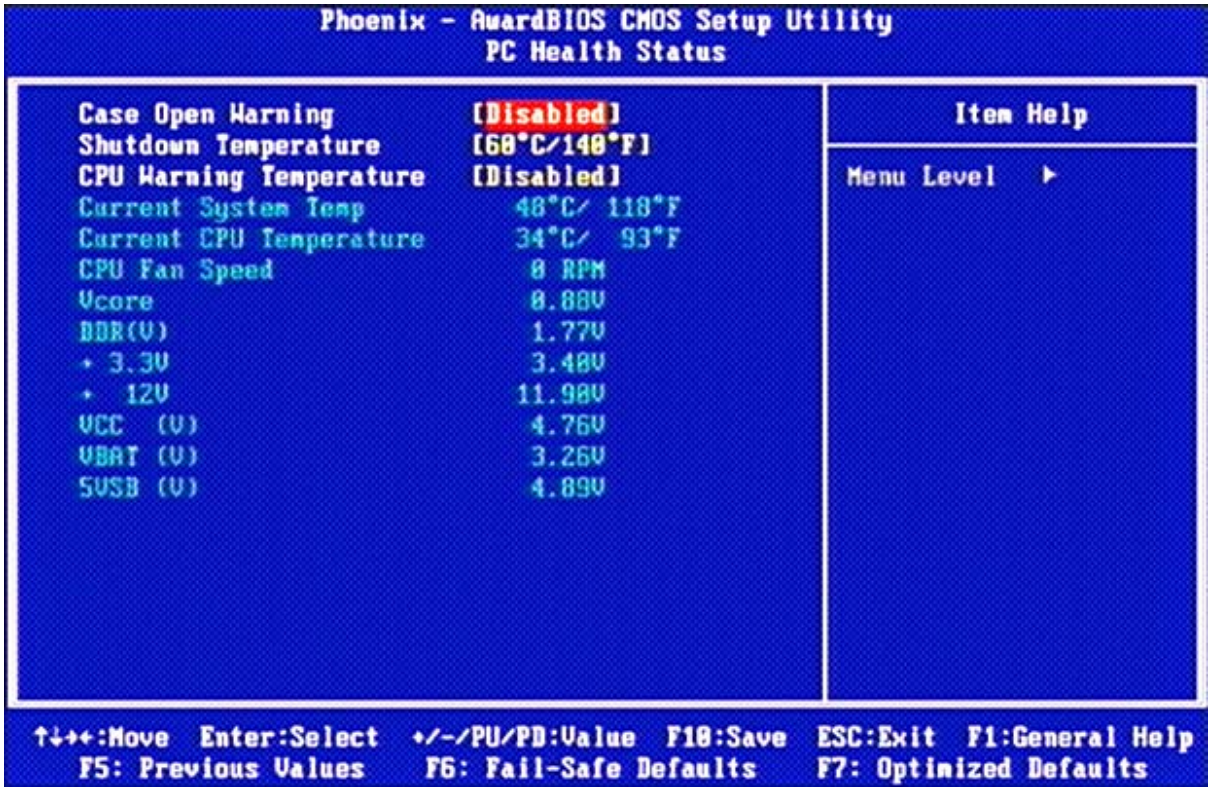
Legacy ISA for devices compliant with the original PC AT bus specification, PCI PnP for devices compliant with the plug and play standard whether designed for PCI bus architecture.

The choice: Enabled, Disabled.

Maximum Payload Size.

Default 128.
The choice: 128, 256, 542, 1024, 2048, 4096.

4.10 PC Health Status



Shutdown Temperature

The choices: Disabled, Enabled.

Shutdown Temperature

The choices : Disabled, 60℃/140℉, 65℃/149℉, 70℃/158℉.

CPU Warning Temperature

This item allows you to set a temperature above which the system will start the beeping warning. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choices: Disabled, 50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145 ℉, 66℃/151℉, 70℃/158℉.

4.11 Default Menu

Selecting "Defaults" from the main menu shows two options which are described below,

Load Fail-Safe Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.12 Supervisor/User Password Setting

Either supervisor or user password can be setup, or both of then. The differences between are:

Set Supervisor Password : can enter and change the options of the setup menus.

Set User Password : just can only enter but do not have the right to change the options of the setup menus. When selecting this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will reboot and Setup can be entered freely.

PASSWORD DISABLED

When a password has been enabled, user will be prompted to enter it every time user tries to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of the computer.

User may determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.13 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after system off. During subsequnet booting of computer, the BIOS configures the system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows user to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

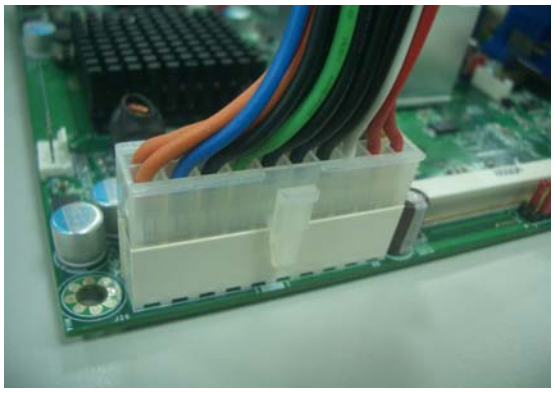
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8070 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

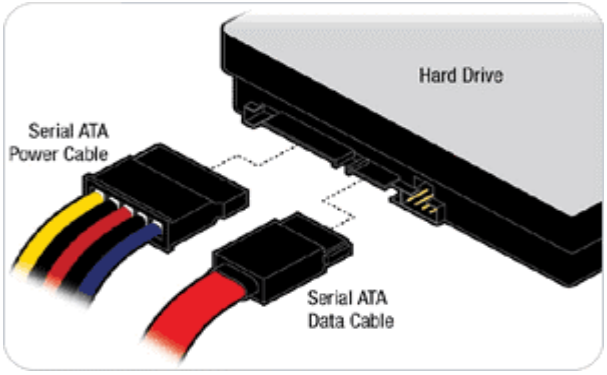
ATX Power Setting

WADE-8070 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J26 (20pins Power Connector). Portwell wants to provide customer better performance and more reliable system. By using this CPU Supplementary will enhance the power drawing to the motherboard. However, J27, +12V CPU Supplementary Power connector must be connected all the time. Otherwise, the system will fail to boot up.



Serial ATA and IDE Hard Disk Setting

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total two connectors, J14 and J15. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on DC 12V power. 200-pin DDR2 SDRAM, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8070, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 Ordering Setting

PER-4110R

One slot PCI-E x1 to PCI-Ex1

5.4 FAQ

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Information & Support

Question:I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP9 to clean your password.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they wull be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9EFF	574K	[Available]
= Conventional memory ends at 636K =		
9F00-9FBF	3K	Extended BIOS Area
9FC0-9FFF	1K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CEBF	59K	Video ROM
CEC0-EFFF	133K	Unused
F000-FFFF	64K	System ROM
HMA	64K	First 64K Extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ